Position statement on lutein and its role in cognition and eye health

The Science and Nutrition Advisory Board*

*The Science & Nutrition Advisory Board on the Macular Xanthophylls and DHA consists of: Paul S. Bernstein, MD, PhD,1 Gary M. Chan, MD,2 Anne B. Fulton, MD,3 Elizabeth J. Johnson, PhD,4 John T. Landrum, PhD,5 and Lewis P. Rubin, MD;6 they were retained to assess the extent to which evidence supports the hypothesis that the xanthophylls function to maintain optimal health of the eye and brain throughout all stages of life. Support: Abbott Nutrition.

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Lutein (L) and zeaxanthin (Z), known as the macular pigment (MP), are selectively taken up by the retina and bind to specific binding proteins.1,2 Humans cannot de novo synthesize L or Z; they must be obtained from dietary sources. L and Z protect the retina by absorbing damaging blue light and a putative role providing antioxidant protection to photoreceptors and retinal pigment epithelium (RPE).3 L and Z are present in the serum and the retina of neonates, evidence that they are transported across the placenta.4 L and Z are also present in colostrum and breast milk.5,6 L levels are greater than those of Z in neonates and during early retinal development. L supplementation improves neonates’ retinal sensitivity and plasma L concentration is correlated with robustness of neonates’ retinal responses.7 Retinal Z increases during the first 3 years of life, in part by the conversion of L into meso-zeaxanthin within the macula.4 This evidence supports the hypothesis that these xanthophylls may be critical to normal retinal development. New data indicate that the relatively low serum levels of L and Z in preterm infants increases their risk for progressive retinopathy of prematurity (ROP).8 Xanthophyll supplementation may provide protection against ROP. In older adults, higher MP densities correlate positively with reduced risk of age-related macular degeneration and better cognitive function. Evidence indicates that L and Z play a critical role in retinal health throughout life, and may also play a role in cognitive function.9 Older women (60-80 yrs) taking a dietary supplement containing L and DHA showed improved cognitive function as measured by verbal fluency. The actions of xanthophylls and DHA in maintaining optimal ocular health are well supported by data for adults. Their role in development during early life is potentially important. Their mechanisms of action will require extensive additional research.

References